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Fingerprint Biometrics in Mobiles

A request for input to Certification and Testing.

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IBPC

NIST
Gaithersburg

Fingerprint Technology in Smartphones

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- World's #1 Fingerprint System Market

- Strong Underlying Market
  - Smartphones sell >100 M Units per month
  - Smartphones sell at prices of 100 to 1000 USD

- Riding the Mobile Market Biometry Wave
  - Inflexion Point early 2015
  - 24 OEMs launched 53 Smartphones with FPC Sensors alone in second half of 2015
  - 24 Further Smartphones released in Q1 2016 with FPC Sensors
  - TAM Growth YoY 15-16 is 105%
  - FPC alone Shipped 1M sensors daily in December, 2015

- Strong End-User Pull.
  - Ease of Use

- Fingerprint Authentication on Smartphones is Trusted.
  - Endorsed by Banks,
  - Generalized through Password Managers, BankID and FIDO
  - Federation of identity

Fingerprint as an Authentication Subsystem

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- Purpose Built for Authentication of the User
- Widely Accepted
  - End Users
  - Relying Parties
- Integrated in Device's security Architecture
  - Android CPP guidelines met with TEE and/or proprietary solutions
- OS-Level APIs Widely Used by App Developers
  - Android Marshmallow
  - iOS
  - Global Platform TEE Biometric API under construction
- Well Defined Envelope – Black Box
  - Sensor
  - Stored Templates
  - Matching Algorithm
- Privacy Enhancing - through End User Owned Device
- Performance Proven in the Field

Goals and Objectives of Certification

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- Trust
  - End User trusts the selected Brandname, OEM
  - Functional Intermediaries: FIDO, GP, EMVCo, GSMA…
  - Relying Party
- Transparency
- Quality Now and into the Future
  - Continued Evolution
- Fit into a demanding Ecosystem and Production Process

Issues with Testing Fingerprint Biometric Performance in Mobiles

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- Short development and sales cycles
  - Integration into Product Development Process
- Privacy by Design
  - Images are not available in COTS products
- Close Performance Relationship in Optimized Subsystem
  - Sensor size and shape, Enrollment interaction, Matcher

Relevant Measures

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- Security Measures
  - False Acceptance Rate (FAR)
  - Spoof Rejection
    - Attack testing
- User Convenience Measures – Leave to Marketplace!
  - False Rejection (FRR)
  - Failure to Enroll (FTE)
  - Speed of Matching

Self Test in Development Process

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- Biometric Subsystem
  - Sensor
  - Image Processing
  - Enrollment S/W
  - Matching Algorithm
- Matching
  - Proprietary Algorithm and Templates
  - Decision by Threshold
- Setting of Threshold
  - Statistical analysis of image DB
  - DB Collected on relevant Sensor with relevant S/W Stack

Verified Self Test Certification

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- Black Box Performance Test of Biometric Subsystem
  - Performed by the Biometric Supplier as part of the Design and devlopment Process
  - Submitted to independent review by recognized test houses.
  - Best Practice guidelines and methodology
- OEM can refer to Certification by supplier product identifier.
- Physical security and integration of sensor and matching is part of TEE certification of handset.

Issues and Concerns

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- Legal and Privacy Concerns in image DB from Self Test
  - Contractual framework
- Best Practice in Supplier Self Testing
- Control over Certification Process
  - Relying Parties, Relevant Security Community
  - FIDO, Global Platform
- Evolving Certification Targets
- Measure Effect on Performance of OEM Integration

Organisation

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- Certification Board (Stewards of the Process)
  - To maintain and evolve the measures and requirements of the Certification in order to remain relevant.
  - Participation
    - EMVCo
    - GP
    - FIDO
    - GSMA
    - Governments
    - Enterprise Security
- Biometric Expertise (advisory to the Board)
  - Fingerprint Sensor Suppliers
  - Academia
  - Government

Participation

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- Work is starting
- Contact me to discuss how you could participate
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Thank you for your attention!

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BEYOND KEYS AND PINS